

UDDEHOLMS AB SAFETY DATA SHEET

UDDEHOLM (BRUSH WELLMAN) Alloys: Moldmax®HH/LH and Weldpak®

Issued: 2010-01-04

Revised: 2010-08-08

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1. COMPANY AND PRODUCT INFORMATION

1.1. Product identifier

Moldmax®HH/LH and Weldpak®

1.2. Relevant identified uses of the substance or mixture and uses advised against

Metal alloys for further processing

1.3. Details of the supplier of the safety data sheet

Importer	Manufacturer
UDDEHOLM AB S-683 85 HAGFORS Sweden Phone: +46 563 170 00 Fax: +46 563 174 61 Internet: www.uddeholm.com	CUSTOMER SERVICE Brush Wellman Inc. Product Stewardship Department 6070 Parkland Boulevard Mayfield Heights, Ohio 44124 Phone: (800) 862-4118 or (216) 486-4200 Fax: (216) 383-4091 www.brushwellman.com

Contact: Lars Sundström. E-mail: lars.sundstrom@uddeholm.se

1.4. Emergency telephone number

Emergency phone number: 112

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Metallic product which poses little or no immediate hazard in solid form. If the material is involved in a fire; pressure-demand self-contained breathing apparatus and protective clothing must be worn by persons potentially exposed to the airborne particulate during or after a fire.

2.2. Label elements

Alloys in massive form do not require labelling under current chemical product classification and labelling regulations, if they are not classified as hazardous to health and environment. However the manufacturer recommends that the product will be labelled with a label as the one in section 16.

2.3. Other hazards

Metallic product which poses little or no immediate hazard in solid form. If the material is involved in a fire; pressure-demand self-contained breathing apparatus and protective clothing must be worn by persons potentially exposed to the airborne particulate during or after a fire.

Processes which generate particulates from the working of alloys can cause hazards to health or environmental effects. May cause an allergic reaction on contact with skin or by inhalation. The alloys do not meet the criteria for PBT or vPvB in accordance with EU Directive 1907/2006 (REACH) Annex XIII.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Alloys are considered as special preparations only when they are remelted, otherwise they are classified as articles. For information on each substance in the alloys, see text below.

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3.2. Mixture

The substances in the special mixture are as follows:

Substance	EINICS-Nr.	Symbol (CLP)	Hazard statements (CLP)	CAS-Nr.	Index-Nr.	Symbol	R-phrases*
Copper (Cu)	231-159-6	GHS09 Warning	H410	7440-50-8	-	Xn, N	R20-50-53
Beryllium (Be)	231-150-7	GHS06 GHS08 Danger	H300 H315 H317 H319 H330 H335 H350i H372	7440-41-7	004-001-00-7	T+	R49-26-25-48/23-36/37/38-43
Cobalt (Co)	231-158-0	GHS08 Danger	H317 H334 H413	7440-48-4	027-001-00-9	Xn	R42/43-53

*For complete wording of R-phrases and hazard statements see section 16.

Substance(weight %)	Moldmax®HH/LH	Weldpak®
Copper (Cu)	97.7-98.2	97.7-98.2
Beryllium (Be)	1.6-2.0	1.6-2.0
Cobalt (Co)	0.2-0.3	0.2-0.35

4. FIRST AID MEASURES

4.1. Description of first aid measures

Show this safety data sheet to the doctor on duty.

4.1.1. Relevant routes of exposure

Inhalation

If dust, fumes or mist inhaled, remove patient to fresh air, allow to rest and keep warm.

Breathing difficulty caused by inhalation of particulate requires immediate removal to fresh air. If breathing has stopped, perform artificial respiration and obtain medical help

Beryllium: The beryllium in this product is not known to cause acute health effects. Inhaling particulate containing beryllium may cause a serious, chronic lung disease called Chronic Beryllium Disease (CBD) in some individuals.

Cobalt: May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause asthma and shortness of breath.

Copper: Inhalation of particulate containing metallic copper can cause ulceration and perforation of the nasal septum.

Skin contact

Thoroughly wash skin cuts or wounds to remove all particulate debris from the wound. Seek medical attention for wounds that cannot be thoroughly cleansed. Treat skin cuts and wounds with standard first aid practices such as cleansing, disinfecting and covering to prevent wound infection and contamination before continuing work. Obtain medical help for persistent irritation. Material accidentally implanted or lodged under the skin must be removed.

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Beryllium: Particulate that becomes lodged under the skin has the potential to induce sensitization and skin lesions.

Cobalt: Prolonged and/or repeated contact may cause dermatitis.

Copper: Particulate may cause a greenish-black skin discoloration.

Eye contact

Avoid getting finely divided particles in the eyes. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Copper: Particulate in the eyes may cause discoloration.

Ingestion

Alloys in massive form are not hazardous, but should be kept out of the mouth. Finely divided particles may be easily ingested along with food, drink or smoking. If large quantities ingested, seek medical advice. Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

Beryllium: The health effect of ingestion of beryllium in the form found in this product is unknown.

Cobalt: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause allergic reaction.

Copper: Copper ingestion causes nausea, vomiting, abdominal pain, metallic taste, and diarrhea. Ingestion of large doses may cause stomach and intestine ulceration, jaundice, and kidney and liver damage.

4.2. Most important symptoms and effects

The alloys in themselves or particles from the alloy are not judged as acute toxic. From the medical point of view, there is no evidence to indicate an absolute or a sharp distinction between harmful and non harmful content. An average content in the air of a single substance at the level of the limit considered, with current knowledge, generally not present any risk of injury or discomfort. It is nevertheless important to strive to keep all air pollutants as low as possible during the exposure limit. A particularly important situation is that if someone is exposed to multiple air pollutants simultaneously or exposed to air pollution related to heavy work. Keep dust levels below the limits mentioned in section 8.1.

4.3. Indication of any immediate medical attention and special treatment needed

There is no indication of immediate medical attention or special treatment documented for the alloys.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Flash Point	Non-combustible as a solid. No ignition as layer of sub 44 micron particles of copper.
Explosive Limits	Not applicable to solids. No ignition as cloud of sub 44 micron particles of nominal copper.
Extinguishing Media	This material is non-combustible. Use extinguishing media appropriate to the surrounding fire.
Unusual Fire and Explosion Hazards	Do not use water to extinguish fires around operations involving molten metal due to the potential for steam explosions.

5.2. Special hazards arising from the substance or mixture

Finely divided copper in contact with chlorates or iodates explode in heat or shock. Copper can react with chlorine, chlorine trifluoride, fluorine, sulfuric acid, kaliumdioxid. Sensitive to air exposure.

Finely divided beryllium reacts with carbon tetrachloride or trichlorethylene and other halons, and with oxidizers, acids and strong bases. Finely divided copper in contact with chlorates or iodates explode in heat or shock. Copper can react with chlorine, chlorine trifluoride, fluorine, sulfuric acid, kaliumdioxid. Sensitive to air exposure.

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5.3. Advice for fire-fighter

Pressure-demand self-contained breathing apparatus must be worn by firefighters or any other persons potentially exposed to the metal fumes or dust released during or after a fire.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures.

If this material is a particulate, establish a restricted entry zone based on the severity of the spill. Persons entering the restricted zone must wear adequate respiratory protection and protective clothing appropriate for the severity of the spill (see Section 8).

6.2. Environmental precautions

Prevent particulates from entering watercourses or drains. Avoid formation of dust clouds.

6.3. Methods and material for containment and cleaning up

Cleanup spills with a vacuum system utilizing a high efficiency particulate air filtration system followed by wet cleaning methods. Special precautions must be taken when changing filters on the vacuum cleaners used to clean up hazardous materials. Be careful to minimize airborne generation of particulate and avoid contamination of air and water. Do not use compressed air, brooms, or conventional vacuum cleaners to remove particulate from surfaces as this activity can result in elevated exposures to airborne particulate.

6.4. Reference to other sections

See also section 8.2.7.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Extraction should be used when working with particulate material (dust, fumes, mist). Avoid prolonged inhalation of dust. Wear gloves to avoid contact with skin (see Section 8). Working areas should be provided with extraction. Check ventilation equipment regularly to ensure it is functioning properly.

Machining operations are usually performed under a liquid lubricant/coolant flood which assists in reducing airborne particulate. Prevent coolant from splashing onto floor areas, external structures or operators' clothing. Utilize a coolant filtering system to remove particulate from the coolant.

Factories should be kept clean to avoid any unnecessary contamination.

Do not to eat, drink and smoke in work areas and wash hands/shower when leaving the working areas.

7.2. Conditions for safe storage, including any incompatibilities

Store in a dry environment.

7.3. Specific end use(s)

See section 13.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

All over 8 hour period unless otherwise stated. Monitoring procedures are not required.

Cobalt UK	*WEL	0.1mg/m ³	total	
	Sweden	*NGV	0.05mg/m ³	total
Copper			2mg/m ³	respirable
	UK	WEL	0.2mg/m ³	fume
			1mg/m ³	dusts and mist
	Sweden	NGV	1mg/m ³	total
Beryllium	UK	WEL	0.002mg/m ³	total
	Sweden	NGV	0.002mg/m ³	total

*Workplace exposure limits in UK and Sweden.

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8.2. Exposure control

Always check the applicability of any protective equipment with your supplier. Always wear protective clothing when handling dusts and other particulates. Conduct an exposure risk assessment of processes to determine if conditions or situations exist which dictate the need for additional controls or improved work practices.

8.2.1. Eye/face protection

Always wear eye protection when handling dusts and other particulates, eg safety glasses with side protection, safety goggles or visor.

8.2.2. Skin protection

Always wear protective clothing when handling dusts and other particulates. Wear hand protection, eg leather gloves when handling alloys with sharp edges to avoid cuts.

Protective over garments or work clothing must be worn by persons who may become contaminated with particulate during activities such as machining, furnace rebuilding, air cleaning equipment filter changes, maintenance, furnace tending, etc. Contaminated work clothing and over garments must be managed in a controlled manner to prevent secondary exposure to workers of third parties, to prevent the spread of particulate to other areas, and to prevent particulate from being taken home by workers.

8.2.3. Hand protection

Wear hand protection, eg leather gloves when handling alloys with sharp edges to avoid cuts. Always wear disposable nitrile or vinyl gloves when handling particulate material to avoid skin contact. Where necessary wear the disposable gloves under work gloves to protect against both types of hazard.

8.2.4. Respiratory protection

Alloys in delivered in solid form give no health risk through inhalation. In case of prolonged or frequent exposure to particulates, wear particle filter mask (P3).

8.2.5. General hygiene measures

Wash hands well with soap and water after handling dusty materials. Wash contaminated clothing to avoid secondary contamination or contamination of other personnel.

8.2.6. Thermal hazards

Ensure adequate ventilation to keep levels of air-borne particles below occupational exposure limits given above. Working areas should be provided with extraction. Factories should be kept clean to avoid any unnecessary contamination.

8.2.7 Environmental exposure control

Avoid letting dust and fumes entering the outside air.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Product names	Color	Melting point	Density
Moldmax®HH/LH	Brass	871 °C, 1600 °F	8,4 g/cm ³ , 0.302lb/in ³

9.2. Other information

No other physical or chemical parameters are necessary for the alloys.

10. STABILITY AND REACTIVITY

10.1. Reactivity

Alloys are stable. Any reaction should not take place under normal circumstances.

10.2. Chemical stability

Alloys are stable. Corrosion should not take place under normal circumstances.

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10.3. Possibility of hazardous reactions

See section 5.2.

10.4. Conditions to avoid

No special conditions need to be avoided for the alloys, however keep dust and fumes from entering the environment.

10.5. Incompatible materials

Reacts with some acids and caustic solutions to produce hydrogen gas. Hydrogen gas can be an explosion hazard. Powdered aluminum and chlorinated hydrocarbons may react with explosive violence.

10.6. Hazardous decomposition products

None under normal conditions of use.

11. TOXICOLOGICAL INFORMATION

11.1. Effect on humans

Alloys contain cobalt which carries a risk of producing an allergic reaction following prolonged contact or in already sensitised persons. Particles from the alloy are not judged as acute toxic. No further toxicological data available for the alloys. See below for LD50 or LC50 for the individual substances, since no LC50 or LD50 has been established for the mixture as a whole.

Cobalt: Oral LD ₅₀ rat	1500 mg/kg bodyweight (toxic)
Beryllium: Oral LD ₅₀ rat	9.7 mg/kg bodyweight (very toxic at ingestion)
Copper: LC ₅₀ Fish 96h	0,017 mg/l species: Oncorhynchus mykiss (copper ion)

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Alloys contain metals which are considered to be very toxic towards aquatic organisms. Finely divided alloys are therefore considered harmful to aquatic organisms.

12.2. Persistence and degradability

The alloys consist of elements that can not degrade any further in the environment.

12.3. Bioaccumulative potential

Alloys contain heavy metals which bioaccumulate in the food chain. The following figures are the bioconcentration factor (BCF) for the substances on their own.

Cobalt, BCF: 4000

Copper, BCF: 29

12.4. Mobility in soil

Metal alloys are not soluble in water or soil. Particles formed by working alloys can be transported in the air.

12.5. Results of PBT and vPvB assessment

Neither the alloys in itself or the substances that it consist of, meet the criteria for PBT or vPvB in accordance with REACH, Annex XIII.

12.6. Other adverse effects

In massive form alloys present no hazards to the aquatic environment. Particles and ions can, never the less, enter the aquatic compartment by means of dusts or smoke, or by liberation due to erosion thereby introducing metals into the ground or water.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

The unused product (massive alloy) is not classified as hazardous waste. Dispose in accordance with appropriate government regulations. When recycled (used in a process to recover metals), this material is not

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classified as hazardous waste under federal law. Seal particulate or particulate containing materials inside two plastic bags, place in a DOT approved container, and label appropriately.

When spent products are declared solid wastes (no longer recyclable), they must be labeled, managed and disposed of, in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

14.1. UN number

Alloys in massive form are not classified as dangerous goods for transport and has no UN number.

14.2. UN proper shipping name

Alloys in massive form are not classified as dangerous goods for transport and has no UN proper shipping name.

14.3. Transport hazard class(es)

Alloys in massive form are not classified as dangerous goods for transport.

14.4. Packing group

There are not any special precautions with which a user should or must comply or be aware of in connection with transport or conveyance either within or outside his premises.

14.5. Environmental hazards

The alloys are not environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID and ADN) and/or a marine pollutant according to the IMDG Code.

14.6. Special precautions for user

There are not any special precautions which a user should or must comply or be aware of in connection with transport or conveyance either within or outside his premises of the alloys. No national or international restrictions on the beryllium copper alloy casting. There is no requirement for labelling, but the supplier urge to label the alloys according to section 16.2.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Alloys in massive form do not subject under MARPOL73/78 and the IBC Code.

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

The cast alloys are as preparations / special preparations for the EU's preparations ISD 1999/45/EC, Regulation (EC) No 1907/2006 (REACH) and mixtures according to the Regulation (EC) 1272/2008 (CLP / EU-GHS) and do not need to be labeled.

Classifications mentioned in table 3.2 concerns substances in their crushed form. Alloys in massive form do not require labelling under current chemical product classification and labelling regulations, if they are not classified as hazardous to health and environment. Contains cobalt and beryllium. Alloys in particulate form eg dust, fumes, mist may cause an allergic reaction on contact with skin or if inhaled.

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out for the product.

16. OTHER INFORMATION

16.1. Modifications since previous version

Version 2: name change of company

The information has been updated in all sections.

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Key literature references and sources for data

The manufacturers MSDS has been a source of information. For this version has <http://kemi.prevent.se/> (a chemical substances database which is a compilation of data from numerous sources) been used for information on individual substances.

Full text of R-phrases used in Section 3

- R20 Harmful by inhalation
- R25 Toxic if swallowed
- R26 Very toxic by inhalation
- R36/37/38 Irritating to eyes, respiratory system and skin
- R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation
- R49 May cause cancer by inhalation
- R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
- R53 May cause long-term adverse effects in the aquatic environment

Full text of Hazard statements used in Section 3

- H300 Fatal if swallowed
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H330 Fatal if inhaled
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H335 May cause respiratory irritation
- H350 May cause cancer
- H372 Causes damage to organs through prolonged or repeated exposure
- H410 Very toxic to aquatic life with long lasting effects
- H413 May cause long lasting harmful effects to aquatic life

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The following label is attached to the product during transportation from Uddeholms AB.
The label can vary in size and has black text and frame on a yellow background.

PRODUCT HANDLING: MOLDMAX LH/HH,
MOLDMAX WELDKPAK and PROTHERM
WARNING!
INHALATION OF DUST OR FUMES MAY BE
HAZARDOUS TO YOUR HEALTH.
READ THE MATERIAL SAFETY DATA SHEET
(MSDS) WITH YOUR EMPLOYER BEFORE
WORKING WITH THIS MATERIAL.
This product contains beryllium and may contain
nickel. Overexposure to beryllium by inhalation may
cause a serious chronic lung disease. If processing
or recycling produces particulate, use exhaust
ventilation or other controls designed to prevent
exposure to workers. Examples of such activities
include melting, welding, grinding, abrasive sawing,
sanding and polishing. Any activity which abrades
the surface of this material can generate airborne
particulate. Copper beryllium, in solid form and as
contained in finished products presents no special
health risks.